ASUS AX-112W

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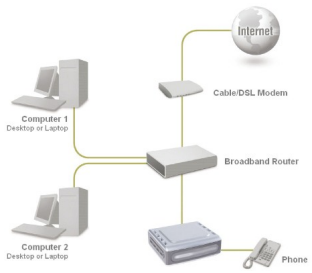
Introduction

Everybody is accustomed to the fact that digital telephony in home segment could be represented by either SIP-adapter or by means of hardware telephone featured by similar protocol. Today, in our lab, we will examine ASUS AX-112W wireless router which provides voice functions in addition to general network features.

Voice transfer via IP-networks is now commonly used. But in order to have an opportunity for voice communication a user had either to install special software to his PC (e.g. Skype), or to purchase additional hardware, that is VoIP-device (SIP or H.323): telephone or adapter. If a user had several PCs or laptops at home, then purchasing a router became necessary.



The use of such “combine” as ASUS AX-112W allows going without a number of devices and yet keeping advantages of modern voice technologies. All that you need is just to connect all the wires to one device, configure wireless segment and enjoy the benefits of civilization.

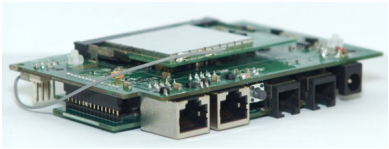
Let us study this device in detail.

External and internal design

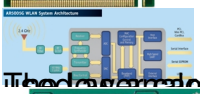
ASUS AX-112W wireless router with voice functions has a white plastic case which is traditional for SOHO class products. Mirror-like front and side panels are the exceptions. It should be also mentioned that this model is supplied with a portable case for the device carrying. Rubber mounts on the bottom as well as T-shaped manufacturing holes make it possible to install the device not only on the table but also on the wall.

The rear panel of AX-112W contains two FE-ports (RJ-45) for home and service provider network connections, two analog telephone ports (RJ-11) for telephone connection and access to PSTN, power connector and Reset button. In spite of the fact that ASUS AX-112W is a wireless router, there is neither changeable nor unchangeable external antenna – the whole wireless section is put inside the case.

The inner part of the device is much more interesting. Microelectronic structure is composed of three green textolite cards, arranged in parallel.



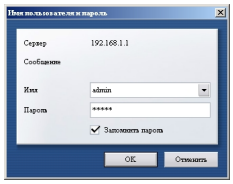
The most simple one is, probably, a wireless module, which could be characterized as a Lite-On product with Atheros microchip AR5005G and supporting 802.11b & 802.11g standards. AR5005G card operational chart is provided under miniPCI module figure.



Review of definitely interesting Asus AX-112W hardware is completed hereby, and we pass on

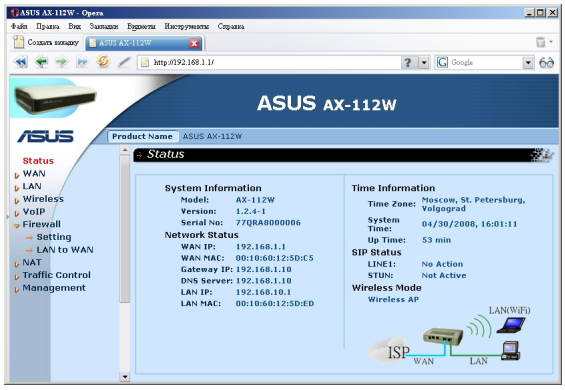
Web-interface review

To get an access to AX-112W web-interface you should put an address 192.168.1.1 in the address bar of any browser and then type-in the login and password, equal to admin/admin by default.

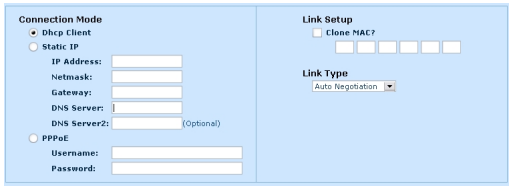


Upon successful authentication, the user finds himself in the router main page, where the system, network and date/time information are presented. Let’s make a brief review of the most

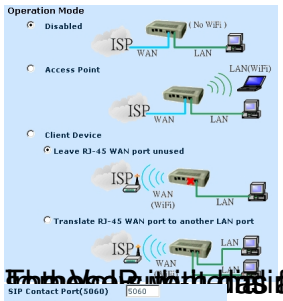
interesting features of the device, which can be controlled via the web-interface.

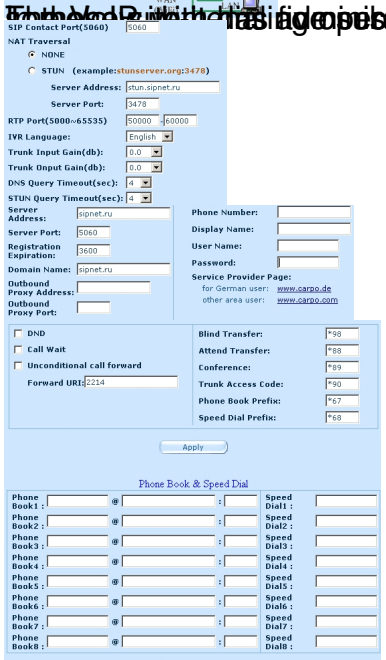


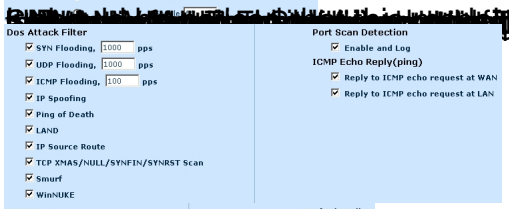
In the Settings subitem of the WAN menu there are parameters of AX-112W external interface. Only three modes of WAN-port are supported at the moment: dynamic (DHCP Client), static (Static IP) and PPPoE. There is no support of PPTP tunneling protocol popular in Russia. It can make the use of this voice device in some providers' network impossible.

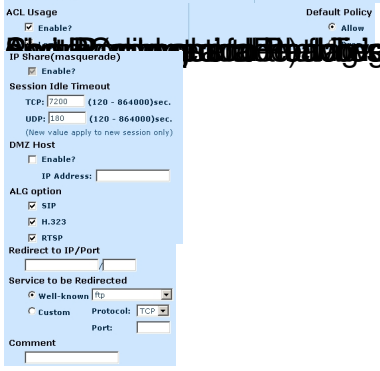


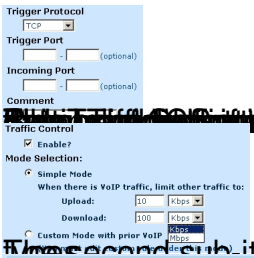
We find the settings of AX-112W wireless part interesting as they allow the router to be both the access point and the wireless client. In the last case, there exists the possibility to combine WAN and LAN ports into one segment of local network. At present, only few models introduced by manufacturers are featured by such options. The wireless network client support will enable connection of the existing wired network to any available access point thus providing internet connection for wired PCs and SIP service as well.

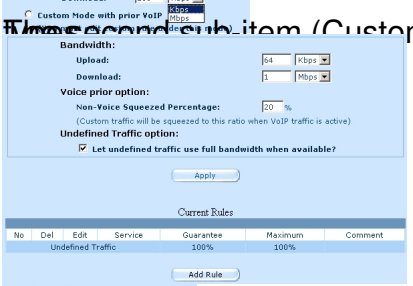

Operation Mode
Disabled
(No WiFi)
ISP
WAN
LAN
Access Point
LAN(WiFi)
Client Device
Leave RJ-45 WAN port unused
WAN (WiFi)
Translate RJ-45 WAN port to another LAN port

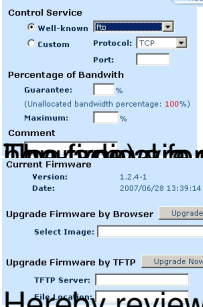

SIP Contact Port(5060)
NAT Traversal
NONE
STUN (example:stunserver.org:3478)
Server Address:
Server Port:
RTP Port(5000~65535)
IVR Language:
Trunk Input Gain(db):
Trunk Onput Gain(db):
DNS Query Timeout(sec):
STUN Query Timeout(sec):
Phone Number:
Display Name:
User Name:
Password:
Service Provider Page:
Registration Expiration:
Domain Name:
Outbound Proxy Address:
Outbound Proxy Port:
DND
Call Wait
Unconditional call forward
Forward URI:
Blind Transfer:
Attend Transfer:
Conference:
Trunk Access Code:
Phone Book Prefix:
Speed Dial Prefix:
Apply
Phone Book & Speed Dial
Phone Book1 :
Speed Dial1 :
Phone Book2 :
Speed Dial2 :
Phone Book3 :
Speed Dial3 :
Phone Book4 :
Speed Dial4 :
Phone Book5 :
Speed Dial5 :
Phone Book6 :
Speed Dial6 :
Phone Book7 :
Speed Dial7 :
Phone Book8 :
Speed Dial8 :
Apply
CODECS
Selected
Packetization
G711U
G711A
G723
G729
Prefer Codec
Silence Suppression
Jitter Buffer
DTMF Method
RFC2833 payload value
Regenerate DTMF tone
Phone Default Connect to:
VOIP Access Digits:
(Phone connect to PSTN)
Caller ID Type:
Keep Alive Timer:
Seconds(zero to disable)
Phone Input Gain(db):
Phone Onput Gain(db):
Phone Flash Time(ms):
Quick Dial Key:
Enable Quick Dial Key as Dial Number?
Dial Prefix '+' Digit
Disable


Dos Attack Filter
SYN Flooding,
pps
UDP Flooding,
ICMP Flooding,
IP Spoofing
Ping of Death
LAND
IP Source Route
TCP XMAS/NULL/SYNFIN/SYNRST Scan
Smurf
WinNUKE
Port Scan Detection
Enable and Log
ICMP Echo Reply(ping)
Reply to ICMP echo request at WAN
Reply to ICMP echo request at LAN


ACL Usage
Enable?
Default Policy
Allow
IP Share(masquerade)
Enable?
Session Idle Timeout
TCP:
(120 - 864000)sec.
UDP:
(New value apply to new session only)
DMZ Host
Enable?
IP Address:
ALG option
SIP
H.323
RTSP
Redirect to IP/Port
Service to be Redirected
Well-known
Custom
Protocol:
Port:
Comment







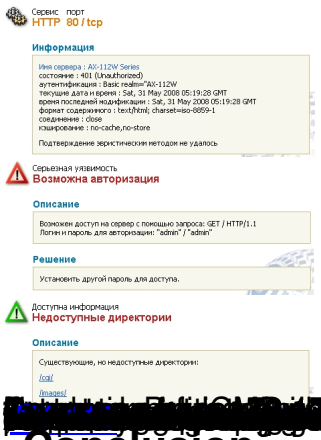
Hereby review of web-interface is over.

Testing

It was decided to begin testing of ASUS AX-112W with determining the router boot time. Under the boot time we understand the time interval between the moment of power connection and return of the first ICMP echo-response. The voice gateway under the test boots in 35 seconds. This is normal for such kind of devices. PC parameters used for testing are as follows.

Components\PC	Stationary PC	Notebook
CPU	Intel Pentium 4 3GHz	Intel Pentium M 1,3 GHz
Motherboard	Asus P5GDC Pro	Arima CO (i855GM/GME)
Memory	2 GB	256 MB
NIC	Marvell Yukon 88E8053	Realtek RTL8139/810x
OS	Windows Vista Ultimate x64 SP1	Windows XP Pro SP3

Then router protection checking from the WAN-port was carried out. The checking was carried out by means of Positive Technologies XSpider 7.5 Demo (Build 2000) network security analyzer. We found only one open TCP-port 80 where web-server for controlling AX-112W is located. Detected vulnerabilities for TCP-80 port are shown below. It should be mentioned that during testing standard password was set. This caused one of scanner's responses. In the real net an administrator will use a more complicated password. This will eliminate this kind of vulnerabilities. In our opinion, the detected vulnerabilities are not critical.



Conclusion

We can’t say that we are fully satisfied with the tested router. Disadvantages of the device are listed below:

* Low speed of commutation and routing.
* There are no new firmwares.
* There is no User manual in Russian and English at web-site and in hard form (only AX-112W setting manual is attached for work with www.carpo.com / www.carpo.de).
* Masquerading is impossible to be switched off.
* Errors occur in some cases at detection of speed and duplex of the line.

However it should be mentioned that a CD disk with quick guide in English is attached to device package. But we also should point out the advantages of AX-112W which are listed below:
* Stability to network attacks.
* Support of tagged virtual network at WAN-port (802.11q).
* Steady operation as a voice gateway.
* Possibility of firmware upgrading not only via HTTP, but via TFTP as well.
* Comfortable soft bag for device carrying.
* Availability of additional plugs for external power supply.
* IVR support.

By the moment the article was written the price of ASUS AX-112W in Moscow online-shops was $100.